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IDENTIFIERS *Bristol Vocational Test

ABSTRACT

A project sought (1) to provide vocational units of study geared to the readability levels of all students in high school vocational education and (2) to develop an instrument to measure achievement in vocational education with this same element of readability in mind. Pre- and posttests measuring vocational achievement and reading levels (project-developed Bristol Vocational Test and California Reading Test) were administered to 140 students. Nine vocational modules were developed and 100 students with low reading levels were instructed using the modules, while 40 students were instructed as a control group without benefit of the modules. Scores by the experimental group were significantly higher than those of the control group with the experimental group gaining 6.25 points on the vocational test as compared with 2.53 points by the control group, and gaining .85 years in reading as compared to .42 in the control group. The Virginia Affective Assessment (VAAQ) was also administered, results showing the attitudes and self-concepts of the experimental students to be greatly improved from pre- to post testing. Conclusions were that all students in the high school vocational curriculum should be able to read and comprehend the vocational modules. It was recommended that the modules be disseminated to other areas of the state and that the Bristol Vocational Test, which through additional testing and computer analysis proved to be a valid instrument, be administered to a large sample of students to further evaluate validity and readability. (BL)

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ED146400

FINAL REPORT

"THE DEVELOPMENT OF VOCATIONAL MODULES AND AN EVALUATIVE INSTRUMENT AT READABILITY LEVELS WHICH ARE COMPREHENSIBLE BY ALL STUDENTS IN THE HIGH SCHOOL VOCATIONAL PROGRAM"

RESEARCH PROJECT IN VOCATIONAL EDUCATION
PART D, SECTION 142-D
PUBLIC LAW 90-576

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 013 365

OCTOBER 1, 1977

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Report Summary

Project Dates: July 1, 1976 - June 30, 1977

Project Goals and Objectives:

The project sought to provide vocational units of study which were geared to the readability levels of all students in vocational areas of study. A second goal was to develop an instrument to measure achievement in vocational education with this same element of readability in mind. Ultimate goals were directed toward student success and accurate evaluation of achievement.

Project Procedures:

The staff-developed vocational modules were utilized for instruction of 100 students on an experimental basis. A control group of 40 students without the benefit of the modules was tested. Pre and post tests measuring vocational achievement and reading levels were administered to both groups. The project-developed Bristol Vocational Test Forms A and B and California Reading Test Forms 4-A and 4-B were utilized to accomplish this comparison. Gains and losses were compared by the investigator and the University of Virginia Bureau of Research Methodology. Initial readability levels were determined by use of the Fry Formula. Final readability levels were computed by use of the Dale-Chall Formula. For the purpose of evaluating the validity and reliability of the Bristol Vocational Test instrument, approximately 1,000 students in Virginia and Tennessee were also tested.

Results and Accomplishments:

All project goals were accomplished. Nine vocational modules were developed, printed and utilized successfully by 100 high school students with lower-than-average reading ability. An evaluative instrument for vocational achievement was reprinted. The instrument was determined to be valid, readable, and most importantly comprehensible.

Many students are lost due to an inability to comprehend the material they are expected to learn and use. If we have taken a step toward saving these students, our investment has been worthwhile.

Evaluation:

The Bristol Vocational Test (1st Edition) was computer analyzed on the bases of item discrimination, response frequency and reliability. The item discrimination and response frequency analyses were utilized to revise the first printing. (See Table I Appendix). Split half reliability analyses revealed a .94 which is significant. Norms for the test were also established. (See U. of Va. correspondence dated August 23, 1977)

The vocational modules were analyzed for readability using the Fry and Dale-Chall formulas. These studies revealed that readability of the nine modules ranged from 4.9554 to 7.3645. (See table below)

Table II

Modules	Range
World of Work	4.9554
Carpentry	5.9671
Trucking	6.3488
Environmental	6.4898
Cosmetology	6.6759
Automobile Engine	6.8632
Macrame	6.8632
Secretarial	7.2853
Electricity	7.3645

The students who utilized the modules in their instruction gained an average of 6.25 points on the Vocational Test as compared with 2.53 points by the control group. The experimental group also gained .85 yrs. in reading as compared to .42 in the control group. Both gain scores by the experimental group are significantly higher than the control group.

The Virginia Affective Assessment (V.A.A.Q.) was also administered and analyzed. U. Va. found the attitudes and self-concepts of experimental students to be greatly improved from pre to post testing.

Conclusions and Recommendations:

Based on readability determinations, all students in the high school vocational curriculum should be able to read and comprehend the vocational modules. Success demonstrated by experimental students with low reading levels is supportive of this conclusion. Computerized analysis of the Bristol Vocational Test show it to be a reasonably valid instrument in its first printing. Based on results of this analysis, poor or weak items of the test were deleted, and the test was printed for the second time. It is recommended by this staff that the second edition test be administered on a basis similar to the first edition. Analysis of this edition is expected to produce even better results.

Body of the Report

This project was directed toward the goal of producing readable, comprehensible vocational modules of study and an instrument of achievement evaluation which also had these characteristics. In a preliminary study conducted by the investigator, it was found that a random sampling of 150 students enrolled in vocational education (grades 9-12) were reading at a level which was 2.9 years below grade placement. Therefore, there is an indication that vocational materials, in order to be comprehensible by all students, should be written on levels below current grade determinations. A Title III, E.S.E.A. project of interest to this project is being conducted in Oakland, Michigan.[1] It is entitled "Vocational Reading Power Project." The readability and achievement data from this project indicate that in over fifty percent of the cases there are significant numbers of students who will not be able to cope with the reading demands of their texts. This study points out a definite need to evaluate material as to readability level and not content alone.

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[1] Vocational Reading Power Project. E.S.E.A. Title III, Oakland County Vocational Education Project, 1973.

Readability levels which are higher than the students comprehension capability often cause failure. After experiences of failure the student tends to assume a low self-concept. This can only be overcome by the presence of success. Success and motivation work hand-in-hand to promote a successful learner. In one recent survey, it was found that a group of dropouts had all assumed unskilled jobs. Communication between this group and the students in the vocational program of the same school "worked wonders toward motivation."[2]

Unemployment, unskilled workers, and welfare seem to be in the news everyday. This trend must be reversed. This investigator feels strongly that one method of accomplishing this is to give students motivation through success. We must give students material they can comprehend and tasks they can master. It was the major goal of this project to provide this type of material.

This project sought to provide an evaluative instrument with readability levels appropriate for all students enrolled in vocational programs of study. This objective was accomplished in the production of the Bristol Vocational Test. Mean scores on this test (See U. of Va. correspondence in Appendix) indicate that the instrument was readable and comprehensible by sample groups. This investigator encountered only one student in the random sample of 1,000 that could not deal with the content of the instrument. A future goal of this project is utilization of this instrument by teachers and administrators to measure the effectivness of their vocational program. Instructors could benefit from the assurance that all students in their program would have material and an evaluative instrument that fell within their range of comprehension.

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[2] Esposito, John and Moppock, Robert, "Group Guidance for Prospective Dropouts, An Exchange of Letters, Vocational Guidance Quarterly, December 1968, pp. 132-133.

Another goal of the project was the production of vocational modules of study which were comprehensible by all students in the vocational program. In the accomplishment of this objective, nine vocational modules were produced which ranged in readability from fifth to ninth grade levels. These modules of study were utilized to instruct an experimental group of students who were reading below grade level. A random sample control group was taught without the benefit of these instructional modules. Students were pre and post tested using the California Achievement Test in Reading and the Bristol Vocational Test. The staff noted significant interest and enjoyment on the part of the experimental students in the completion of the modules. This motivational factor may be the single most important by-product of the project. Success increases initiative and willingness to learn. Failure decreases initiative, and eventually these students are lost because of continued failure. If we can save these students, our investment will have been worthwhile.

The tangible results of this program were significant. The experimental students gained an average of 6.25 points on the Vocational Achievement Test, while the control group gained only 2.53 points per student. The experimental students also gained .85 years in reading as compared to .42 in the control students. The tests administered to both groups were identical and evaluation sessions included almost identical environments. Project results were analyzed by the University of Vriginia Bureau of Research Methodology. Their summary concluded that the experimental groups scored significantly higher than the control group. The University of Virginia also administered the V.A.A.Q. (Virginia Affective Assessment Questionnaire) to these groups. They found the attitudes and self-concept of the experimental students to be greatly improved on a pre-post analysis. This improvement in reading, vocational achievement and gains in self-concept and attitudes are all significant. These gains, working in combination, evolved successful productive students. This was the project's main goal.

Based on these conclusions, the project has attained its goals. Readability level determinations indicate that virtually all students in the high school vocational curriculum should be able to read and comprehend the vocational modules. The success demonstrated by experimental students with low reading levels is supportive of this conclusion. The high motivation levels observed in experimental students is also significant. These modules may be used in several ways. They may be utilized to introduce programs of study to individuals who experience difficulty with manuals which have high readability levels. They may also be used as mini courses of study or instruments of guidance for students who have yet to decide on a career goal.

Computerized analysis of the Bristol Vocational Test show it to be a reliable instrument (.94) in its first printing. Using this analysis, poor or weak items of the test were deleted, and the test was printed for the second time. Analysis of this edition should show it to be even more reliable and valid than the first. This test may be utilized by teachers and administrators to measure the effectiveness of their vocational programs. Instructors would also benefit from the assurance that all students in their program would have instructional material and an evaluative instrument that fell within their range of comprehension.

It is recommended that these modules be disseminated to other areas of the state for classroom use. It is also recommended that the Bristol Vocational Test (2nd Edition) be administered to a large sampling of students to further evaluate validity and readability. The initial results from these materials are remarkable, both in student response and evaluative results. The true worth of these items will be their acceptance and use in the classrooms of Virginia to help students achieve success and become productive citizens.

As stated: Goodman [3] found that there was an adequate supply of occupational material at third grade reading level which tapered from kindergarten to sixth

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[3] Goodman, Sylvia, "Occupational Information Materials in Selected Elementary and Middle Schools," December, 1970.

grade. However, she found that there is relatively little material available for upper elementary, junior high and high school levels. Thus there is a need to develop new materials and to supplement existing materials.

In conclusion, Ralph Tyler, discussing the problems of disadvantaged children and compensating approaches to making them full participants in society, said:

> "The conditions of life today require the education of everyone who would fully participate in it. At least 15 percent to 20 percent of our children are not now attaining the level of education required for employment, for intelligent citizenship, for responsible parenthood, or for achieving their own potential." [4]

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[4]Frantz, Mervin. The Cluster Concept: A Multi-Occupational Approach to Vocational Education. Dept of Education, University of Georgia, 1970. pp. 185-197.

APPENDIX A

BIBLIOGRAPHY

BIBLIOGRAPHY

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APPENDIX B

ADDITIONAL TABLES

TABLE I

DEPARTMENT OF RESEARCH METHODOLOGY
University of Virginia
Ruffner Hall
Charlottesville, Virginia 22903

August 23, 1977

TO: Dale Morrell

FROM: Ramsay Selden

SUBJECT: Norms for Vocational Test

Enclosed are conversion tables showing percentiles for each raw score on the subtest and total scores for the vocational test. Form A, Fall, and Form B, Fall, are shown first, then Form B, Spring. Only 14 cases were available for Form A, Spring, so this is not reported.

We have other data on the tests on our print-out, so call if anything further is needed.

FALL, FORM A

Auto Mechanics

Score	Percentile
0	2
1	6
2	14
3	27
4	42
5	62
6	81
7	92
8	96
9	100

Electricity

Score	Percentile
1	1
2	9
3	19
4	40
5	61
6	75
7	86
8	95
9	99
10	100

Business Subjects

Score	Percentile
0	2
1	9
2	17
3	37
4	60
5	75
6	92
7	99
8	100

Cosmetology

Score	Percentile
0,1	1
2	6
3	12
4	19
5	37
6	48
7	67
8	83
9	91
10	97
11	100

Printing

Score	Percentile
0	3
1	21
2	51
3	79
4	92
5	97
6	100

Building Trade

Score	Percentile
0,1	1
2	2
3	11
4	18
5	34
6	56
7	69
8	83
9	94
10	96
11	99
12	100

FALL, FORM A

Drafting

Score	Percentile
0	2
1	4
2	10
3	19
4	33
5	48
6	61
7	75
8	85
9	92
10	97
11	100

Distributive Education

Score	Percentile
0	4
1	9
2	18
3	26
4	42
5	55
6	76
7	89
8	98
9	100

Total

Score	Percentile
12	1
22	3
24	4
25	6
26	6
27	9
28	11
29	14
30	15
31	22
32	25
33	27
34	29
35	33
36	40
37	42
38	46
39	48
40	51
41	57
42	62
43	66
44	70
45	75
46	78
47	81
48	83
49	83
50	85
51	86
52	88
53	92
54	94
55	95
56	96
57	96
58	97
61	98
62	99
63	99
64	100

Mean = 39.849
Standard Deviation = 9.536
Standard Error = .809

FALL, FORM B

Auto Mechanics

Score	Percentile
1	1
2	2
3	7
4	20
5	32
6	44
7	57
8	77
9	89
10	96
11	99
12	100

Electricity

Score	Percentile
1	2
2	7
3	13
4	33
5	49
6	66
7	75
8	89
9	96
10	99
11	100

Business Subjects

Score	Percentile
1	1
2	7
3	13
4	23
5	42
6	66
7	87
8	100

Cosmetology

Score	Percentile
0	1
1	2
0	2
3	9
4	20
5	25
6	37
7	50
8	61
9	88
10	96
11	100

Printing

Score	Percentile
0	4
1	12
2	30
3	54
4	75
5	93
6	100

Building Trades

Score	Percentile
1	2
2	4
3	12
4	21
5	37
6	52
7	66
8	79
9	84
10	91
11	97
12	98
13	98
14	100

FALL, FORM B

Drafting

Score	Percentile
1	4
2	8
3	20
4	28
5	34
6	40
7	48
8	54
9	62
10	75
11	83
12	93
13	96
14	100

Distributive Education

Score	Percentile
0	2
1	9
2	21
3	43
4	71
5	89
6	98
7	100

Total

Score	Percentile
19	1
21	2
23	3
25	4
26	5
28	7
29	8
30	11
31	11
32	13
33	16
34	16
35	20
36	22
37	27
38	30
39	30
40	32
42	39
43	41
44	43
45	48
46	54
47	55
48	59
49	61
50	63
51	68
52	70
55	74
56	77
57	81
58	82
59	84
60	86
61	88
62	89
63	93
64	94
65	96
67	97
68	98
69	98
71	99
72	100

Mean = 46.270
Standard deviation = 11.947
Standard error = 1.082

SPRING, FORM B

Auto Mechanics

Score	Percentile
1	1
2	3
3	7
4	21
5	34
6	52
7	76
8	87
9	93
10	97
11	99
12	100

Electricity

Score	Percentile
1	1
2	6
3	20
4	39
5	52
6	71
7	85
8	91
9	96
10	98
11	99
13	100

Business Subjects

Score	Percentile
0	1
1	2
2	10
3	24
4	38
5	61
6	76
7	94
8	100

Cosmetology

Score	Percentile
2	4
3	6
4	12
5	17
6	31
7	58
8	73
9	88
10	96
11	100

Printing

Score	Percentile
0	6
1	18
2	40
3	63
4	79
5	93
6	98
7	99
8	100

Building Trades

Score	Percentile
1	1
2	6
3	9
4	17
5	31
6	43
7	61
8	75
9	80
10	90
11	93
12	98
13	100

FORM B, SPRING

Drafting

Score	Percentile
0	2
1	5
3	8
4	17
5	21
6	28
7	36
8	46
9	55
10	69
11	82
12	92
13	94
14	100

Distributive Education

Score	Percentile
0	1
1	11
2	24
3	43
4	68
5	88
6	98
7	100

Total

Score	Percentile
24	1
27	2
28	3
30	6
31	9
32	10
33	12
34	13
35	17
36	18
37	20
38	26
39	31
40	31
41	33
42	37
43	40
44	46
45	48
46	52
47	57
48	59
49	62
50	66
51	73
52	74
53	76
54	79
55	83
56	88
57	89
58	90
59	91
60	92
62	94
63	96
64	97
66	98
67	99
71	100

Mean = 45.909
Standard deviation = 9.917
Standard error = .902

FALL, FORM A

Auto Mechanics

Score	Percentile
0	2
1	6
2	14
3	27
4	42
5	62
6	81
7	92
8	96
9	100

Electricity

Score	Percentile
1	1
2	9
3	19
4	40
5	61
6	75
7	86
8	95
9	99
10	100

Business Subjects

Score	Percentile
0	2
1	9
2	17
3	37
4	60
5	75
6	92
7	99
8	100

Cosmetology

Score	Percentile
0,1	1
2	6
3	12
4	19
5	37
6	48
7	67
8	83
9	91
10	97
11	100

Printing

Score	Percentile
0	3
1	21
2	51
3	79
4	92
5	97
6	100

Building Trade

Score	Percentile
0,1	1
2	2
3	11
4	18
5	34
6	56
7	69
8	83
9	94
10	96
11	99
12	100

FALL, FORM A

Drafting

Score	Percentile
0	2
1	4
2	10
3	19
4	33
5	48
6	61
7	75
8	85
9	92
10	97
11	100

Distributive Education

Score	Percentile
0	4
1	9
2	18
3	26
4	42
5	55
6	76
7	89
8	98
9	100

Total

Score	Percentile
12	1
22	3
24	4
25	6
26	6
27	9
28	11
29	14
30	15
31	22
32	25
33	27
34	29
35	33
36	40
37	42
38	46
39	48
40	51
41	57
42	62
43	66
44	70
45	75
46	78
47	81
48	83
49	83
50	85
51	86
52	88
53	92
54	94
55	95
56	96
57	96
58	97
61	98
62	99
63	99
64	100

Mean = 39.849
Standard Deviation = 9.536
Standard Error = .809

FALL, FORM B

Auto Mechanics

Score	Percentile
1	1
2	2
3	7
4	20
5	32
6	44
7	57
8	77
9	89
10	96
11	99
12	100

Electricity

Score	Percentile
1	2
2	7
3	13
4	33
5	49
6	66
7	75
8	89
9	96
10	99
11	100

Business Subjects

Score	Percentile
1	1
2	7
3	13
4	23
5	42
6	66
7	87
8	100

Cosmetology

Score	Percentile
0	1
1	2
0	2
3	9
4	20
5	25
6	37
7	50
8	61
9	88
10	96
11	100

Printing

Score	Percentile
0	4
1	12
2	30
3	54
4	75
5	93
6	100

Building Trades

Score	Percentile
1	2
2	4
3	12
4	21
5	37
6	52
7	66
8	79
9	84
10	91
11	97
12	98
13	98
14	100

FALL, FORM B

Drafting

Score	Percentile
1	4
2	8
3	20
4	28
5	34
6	40
7	48
8	54
9	62
10	75
11	83
12	93
13	96
14	100

Distributive Education

Score	Percentile
0	2
1	9
2	21
3	43
4	71
5	89
6	98
7	100

Total

Score	Percentile
19	1
21	2
23	3
25	4
26	5
28	7
29	8
30	11
31	11
32	13
33	16
34	16
35	20
36	22
37	27
38	30
39	30
40	32
42	39
43	41
44	43
45	48
46	54
47	55
48	59
49	61
50	63
51	68
52	70
55	74
56	77
57	81
58	82
59	84
60	86
61	88
62	89
63	93
64	94
65	96
67	97
68	98
69	98
71	99
72	100

Mean = 46.270
Standard deviation = 11.947
Standard error = 1.082

SPRING, FORM B

Auto Mechanics

Score	Percentile
1	1
2	3
3	7
4	21
5	34
6	52
7	76
8	87
9	93
10	97
11	99
12	100

Electricity

Score	Percentile
1	1
2	6
3	20
4	39
5	52
6	71
7	85
8	91
9	96
10	98
11	99
13	100

Business Subjects

Score	Percentile
0	1
1	2
2	10
3	24
4	38
5	61
6	76
7	94
8	100

Cosmetology

Score	Percentile
2	4
3	6
4	12
5	17
6	31
7	58
8	73
9	88
10	96
11	100

Printing

Score	Percentile
0	6
1	18
2	40
3	63
4	79
5	93
6	98
7	99
8	100

Building Trades

Score	Percentile
1	1
2	6
3	9
4	17
5	31
6	43
7	61
8	75
9	80
10	90
11	93
12	98
13	100

FORM B, SPRING

Drafting

Score	Percentile
0	2
1	5
3	8
4	17
5	21
6	28
7	36
8	46
9	55
10	69
11	82
12	92
13	94
14	100

Distributive Education

Score	Percentile
0	1
1	11
2	24
3	43
4	68
5	88
6	98
7	100

Total

Score	Percentile
24	1
27	2
28	3
30	6
31	9
32	10
33	12
34	13
35	17
36	18
37	20
38	26
39	31
40	31
41	33
42	37
43	40
44	46
45	48
46	52
47	57
48	59
49	62
50	66
51	73
52	74
53	76
54	79
55	83
56	88
57	89
58	90
59	91
60	92
62	94
63	96
64	97
66	98
67	99
71	100

Mean = 45.909
Standard deviation = 9.917
Standard error = .902

Table III
Form A
Percentage of Correct Answers

Circled item denotes items deleted from 2nd Edition

Auto Mechanics

1.	39
2.	45
3.	47
(4.)	23
5.	44
6.	36
7.	45
8.	59
9.	50
10.	30
11.	83
12.	72
13.	72

Cosmetology

1.	81
2.	50
3.	71
4.	47
5.	79
6.	66
7.	88
8.	84
9.	77
(10.)	44
11.	86

Electricity

1.	63
2.	84
3.	63
4.	66
5.	63
(6.)	22
(7.)	32
(8.)	15
9.	87
10.	75
11.	74
12.	35
13.	56

Printing

1.	59
2.	67
3.	34
4.	63
5.	44
6.	46
7.	90
8.	62

Business Subjects

1.	93
2.	33
3.	54
4.	101
5.	85
6.	44
7.	49
8.	83

Building Trades

1.	101
2.	61
3.	70
4.	55
5.	59
6.	94
(7.)	20
8.	88
9.	70
10.	49
11.	38
12.	28
13.	30
(14.)	26

Drafting

1.	73
2.	79
3.	81
4.	45
5.	59
6.	66
7.	20
(8.)	8
9.	85
10.	50
11.	53
12.	90
(13.)	33
14.	32

Distributive Education

1.	75
2.	85
3.	90
(4.)	69
5.	71
6.	88
7.	43
8.	95
9.	89

Table IV
Form B
Percentage of Correct Answers

Circled item denotes items deleted from 2nd Edition

Auto Mechanics	
1.	57
2.	90
3.	33
4.	29
5.	52
6.	37
7.	56
8.	78
(9.)	9
10.	54
11.	44
12.	61
13.	90

Cosmetology	
1.	82
2.	75
3.	90
4.	55
5.	69
6.	101
7.	48
(8.)	35
9.	66
10.	88
11.	97

Electricity	
1.	62
2.	82
3.	42
4.	46
(5.)	7
(6.)	30
7.	27
8.	38
9.	68
10.	49
11.	47
12.	78
(13.)	45

Printing	
1.	42
2.	60
3.	45
4.	35
5.	49
6.	25
7.	69
8.	67

Business Subjects	
1.	49
2.	80
3.	90
4.	96
5.	66
6.	76
7.	62
8.	95

Building Trades	
1.	29
2.	50
3.	26
4.	76
5.	77
6.	42
7.	39
8.	85
9.	59
10.	44
11.	80
(12.)	17
(13.)	39
14.	41

Drafting	
1.	51
2.	79
(3.)	34
4.	52
5.	91
6.	82
7.	93
8.	79
(9.)	44
10.	76
11.	80
12.	70
13.	85
14.	73

Distributive Education	
1.	24
2.	33
3.	45
(4.)	19
5.	35
6.	95
7.	71
8.	95
9.	20

TABLE V

BRISTOL VIRGINIA SCHOOLS
TITLE IV-C

STAFF DEVELOPED MODULES

READABILITY DETERMINATIONS

WORLD OF WORK

1.	105	121	104
2.	8	7	8
3.	0	8	5
4.	13.13	17.29	13.00
5.	0	6.61	4.81
6.	.6512	.8576	.6448
7.	0	1.0737	.7595
8.	3.6365	(Constant)	
9.	4.2877	5.5378	5.0408

Average = 4.9554 5.0 grade level

ENVIRONMENTAL

1.	111	111	116
2.	9	10	8
3.	11	15	22
4.	12.33	11.10	14.50
5.	9.91	13.51	18.96
6.	.61	.55	.72
7.	1.56	2.13	2.99
8.	3.6365	(Constant)	
9.	5.8065	6.3165	7.3465

Average = 6.4898 7.5 grade level

CARPENTRY

1.	100	126	106
2.	5	5	5
3.	8	10	8
4.	20.00	25.20	21.20
5.	8.00	7.94	7.55
6.	.992	1.25	1.05
7.	1.26	1.25	1.19
8.	3.6365	(Constant)	
9.	5.8885	6.1365	5.8765

Average = 5.9671 7.0 grade level

AUTOMOBILE ENGINE

1.	100	103	102
2.	7	6	6
3.	12	23	12
4.	14.29	17.17	17.00
5.	12.00	22.33	11.76
6.	.71	.85	.84
7.	1.89	3.53	1.85
8.	3.6365	(Constant)	
9.	6.2365	8.0165	6.3365

Average = 6.8632 8.0 grade level

MACRAME'

1.	100	103	102
2.	7	6	6
3.	12	23	12
4.	14.29	17.17	17.00
5.	12.00	22.33	11.76
6.	.71	.85	.84
7.	1.89	3.53	1.86
8.	3.6365	(Constant)	
9.	6.2365	8.0165	6.3365

Average = 6.8632 8.0 grade level

ELECTRICITY

1.	107	104	105
2.	8	8	9
3.	19	18	25
4.	13.38	13.00	11.67
5.	17.76	17.31	23.81
6.	.6636	.6448	.5788
7.	2.8043	2.7332	3.7595
8.	3.6365	(Constant)	
9.	7.1044	7.0145	7.9748

Average = 7.3645 9.0 grade level

OFFICE PRACTICE

1.	118	103	100
2.	7	4	7
3.	26	18	12
4.	16.86	25.75	14.29
5.	22.03	17.48	12.00
6.	.8273	1.2772	.7087
7.	3.4785	2.7600	1.8948
8.	3.6365	(Constant)	
9.	7.9423	7.6737	6.2400

Average = 7.2853 9.0 grade level

TRUCKING

1.	133	103	116
2.	6	6	4
3.	20	12	12
4.	22.17	17.17	29.00
5.	15.04	11.65	10.34
6.	1.099	.8516	1.4384
7.	2.3748	1.8395	1.6326
8.	3.6365	(Constant)	
9.	6.0113	6.3276	6.7075

Average = 6.3488 7.0 grade level

COSMETOLOGY

1.	109	127	115
2.	7	8	7
3.	13	17	20
4.	15.57	15.88	16.43
5.	11.93	13.39	17.39
6.	.7722	.7876	.8149
7.	1.8837	2.1142	2.7458
8.	3.6365	(Constant)	
9.	6.2924	6.5383	7.1972

Average = 6.6759 7.5 grade level

INITIAL ANALYSIS - FRY FORMULA

COMPLETED ANALYSIS - DALE/CHALL

APPENDIX C

(TEST) INSTRUMENTS

Removed because of copyright

APPENDIX D

LIST OF INSTRUCTIONAL MATERIALS

LIST OF INSTRUCTIONAL MATERIALS

9 Vocational Modules

- World of Work
- Carpentry
- Trucking
- Environmental
- Cosmetology
- Automobile Engine
- Macrame
- Secretarial
- Electricity

Bristol Vocational Test

- Form A
- Form B